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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,156	02/12/2007	Gerd Hoffmann	AFILM-204	6189

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EXAMINER	
CHANG, AUDREY Y	
ART UNIT	PAPER NUMBER
2872	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,156	HOFFMANN ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 16, 2010 has been entered.

2. This Office Action is also in response to applicant's amendment filed on February 16, 2010 which has been entered into the file.

3. By this amendment, the applicant bas canceled claims 1-24 and has newly added claims 25-29.

4. Claims 25-29 remain pending in this application.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 25-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase “the first reflecting layer and the second reflecting layer consist of metal” and the phrase “the first and second reflecting layers comprises a base material, namely metal" recited in claim 25 are contracting and confusing. It is not clear if the first and second reflecting layers **consist** or **comprise** metal.

The phrase “the first reflecting layer is deposited on a web sheeting” recited in claim 25 is confusing since it is not clear how does this “web sheeting” structurally and logically relate to the at least three layers of the Fabry-Perot filter and the substrate. It is not clear if the web sheeting is the substrate or

not. Or if the "web sheeting" is part of the Fabry-Perot filter. For the purpose of examination, the web sheeting is being interpreted as intermediate member in the manufacturing process of the first reflecting layer and not as part of the Fabry-Perot filter. **However** clarification is required.

The phrase "a metal oxide" recited in claim 26 is confusing. It is not clear if this means the metal is the same or not of the metal for the reflecting layers. If so, the phrase should read as "oxide of the same metal".

The phrase "a metal-nitrogen compound" recited in claim 27 is confusing since it is not clear if the metal is referred to the same metal or not as the reflector. If so, the phrase should read as "a metal-nitrogen compound of the same metal".

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Argoitia et al (PN. 6,777,085) in view of Katsir et al (PN. 6,234,166).**

Argoitia et al teaches an article having Fabry Perot filter coated on a substrate, wherein the article has a substrate (12, Figure 1A), a *first reflecting layer* (14), a spacer or intermediate layer (16) and a *second* ***reflecting*** *layer* (18, please see column 1, line 22, column 3, lines 45-52, and column 5, lines 33-50). Argoitia et al teaches that the first reflecting layer (14) and the second reflecting layer (18) have mutually reflecting facing surfaces that are apart by a *gap* with a thickness of d, wherein the intermediate or spacer layer is interposed in the gap as shown in Figure 1A. Argoitia et al further teaches that the first reflecting layer is comprised of a metal such as *aluminum*, serving as the base material, the spacer layer is

comprised of *aluminum oxide*, which is a chemical compound of aluminum (base material) with oxygen (serves as the further material) and the second reflecting layer may also comprise of a semi-transparent aluminum layer, (please see column 5, lines 44-50). This means the first and second reflecting layers are comprised of **same** base material. Argoitia et al teaches explicitly that the first reflecting layer is opaque and the second reflecting layer is semi-transparent, (please see column 5, lines 50-53 and 48).

This reference has met all the limitations of the claims. This reference does not teach explicitly that the first reflecting layer is deposited on a web sheeting. However *the product-by-process limitations* are not given patentable weight for it does not differentiate the final product from the prior art, (please see MPEP 2173,05(p)). Argoitia et al does teach that the layers are deposited by conventional deposition methods such as chemical vapor deposition (CVD), physical vapor deposition (PVD) and plasma-enhanced CVD, (please see column 8). These deposition methods essentially require a vacuum coating facility with a vacuum chamber (113, Figures 2A, 2B and 2C). **Katsir** et al in the same field of endeavor teaches a method to form reflecting layer, such as metal aluminum reflecting layer, using standard vacuum deposition method wherein the aluminum is deposited on a roll of web sheeting. It would then have been obvious to apply the teachings of Katsir et al to use a web sheeting in the process of depositing the metal material to form the first reflecting layer. The second reflecting layer is deposited on the intermediate layer.

Argoitia et al teaches that the opaque aluminum or reflecting layer has a thickness of 50-80 nm, (please see column 5, line 11) and the spacer or intermediate layer has an optical thickness of about 2 to 8 quarter wavelengths, (please see column 5, lines 29-32) which has physical thickness of about 130-149nm. This reference however does not teach explicitly that the second reflecting layer of the semi-transparent aluminum is about 1 to 20 nm. However one skilled in the art must know that in order for the aluminum to be semi-transparent, it must have a thickness less than 40 nm and preferably between 5 to 40nm. It would then have been obvious to one skilled in the art to modify the second reflecting layer of

semi-transparent aluminum layer to have a thickness be less than 20 nm to have good semi-transparent and semi-reflection properties.

With regard to claims 26-27, Argoitia et al teaches that the first reflecting layer is comprised of a metal such as aluminum, serving as the base material, the spacer layer is comprised of aluminum oxide, which is a chemical compound of aluminum (base material) with oxygen (serves as the further material) and the second reflecting layer may also comprise of a semi-transparent aluminum layer, (please see column 5, lines 44-50). The oxide is implicitly either stoichiometric or non-stoichiometric composition.

9. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Argoitia et al and Katsir et al as applied to claim 25 above, and further in view of the patent issued to Nelson (PN. 6,165,598).

The article having Fabry Perot filter coated on a substrate taught by Argoitia et al in combination with the teachings of Katsir et al as described for claim 25 above has met all the limitations of the claim.

Argoitia et al teaches that the reflecting layers of the Fabry Perot filter are made of aluminum and the spacer or intermediate layer is made of aluminum oxide, but it does not teach that the intermediate layer is alternatively made of aluminum nitride. However Fabry Perot filter is based on interference properties of the multiple layers and both aluminum oxide and aluminum nitride are common or well-known dielectric materials for forming the layers for the interference filter as taught by **Nelson**, (please see column 5, lines 1-5). It would then have been obvious to one skilled in the art to apply the teachings of Nelson to modify the Fabry Perot filter of Argoitia et al to use aluminum nitride as alternative material for the spacer or intermediate layer for the benefit of allowing different design for the Fabry Perot filter. The nitride is implicitly either stoichiometric or non-stoichiometric composition.

10. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Glass et al (PN. 5,363,398) in view of the patent issued to Katsir et al (PN. 6,234,166).

Glass et al teaches a Fabry-Perot filter includes a micro-cavity deposited on a *substrate* (14, Figures 1 and 9) wherein the Fabry-Perot filter is comprised of three layers including a first reflector (15) and second reflector (17) serve as the first and second reflecting layer with mutually facing reflecting surfaces and are spaced apart by a gap of thickness "d" that encloses an *active layer* (16) serves as the intermediate layer. Glass et al teaches that the reflectors have 90 to 95 percents of reflectivity, which is partially reflective and partially transmission. This means the first reflector could have been made to have high reflectivity so it be "opaque" to the incident light so that the incident light does not escape to the substrate layer. Glass et al teaches that the first and second reflectors are made of thin metal films which consisted of metal such as aluminum, (please see column 3, lines 20-35). The active layer or the intermediate layer is made of oxides such as aluminum oxide, (Al_2O_3 please see column 3, line 59 to column 4, line 1). The aluminum oxide is a chemical compound that consisted of aluminum metal, i.e. the same metal as the reflectors, and one further material—oxygen, (please see column 2 line 59, to column 4, line 7).

This reference has met all the limitations of the claims. This reference does not teach explicitly that the first reflecting layer is deposited on a web sheeting. However *the product-by-process limitations* are not given patentable weight for it does not differentiate the final product from the prior art, (please see MPEP 2173,05(p)). Glass et al does teach that the layers are deposited by conventional deposition methods such as chemical vapor deposition (CVD), (please see column 4) that essentially require a vacuum coating facility with a vacuum chamber. **Katsir** et al in the same field of endeavor teaches a method to form reflecting layer, such as a *metal* aluminum reflecting layer, using standard vacuum deposition method wherein the aluminum is deposited on a roll of web sheeting. It would then have been

obvious to apply the teachings of **Katsir** et al to use a web sheeting in the process of depositing the metal material to form the first reflecting layer. The second reflecting layer is deposited on the intermediate layer.

Glass et al teaches that the active layer or the intermediate layer should have a thickness of about half of the wavelength of interest which is about 750 nm, (please see column 4, lines 35-38). This reference however does not teach explicitly about the thickness for the first and second reflectors. But Glass et al does teach to have the first reflector has higher reflectivity than the second reflector and both reflectors to have a reflectivity above 90 percents. So it would then have been obvious to one skilled in the art to manufacture the aluminum reflector with thickness between 50-80 nm to make the reflector essentially opaque for the first reflector and with thickness less than 40 nm, or between 1 to 20 nm, for the second reflector to be semi-transparent. Since one skilled in the art must know that in order for the aluminum to be semi-transparent, it must have a thickness less than 40 nm and preferably between 5 to 40nm, to fulfill the reflectivity requirements for the Fabry-Perot filter.

With regard to claims 26-27, Glass et al teaches that the first reflecting layer is comprised of a metal such as aluminum, serving as the base material, the spacer layer is comprised of aluminum oxide, which is a chemical compound of aluminum (base material) with oxygen (serves as the further material) and the second reflecting layer may also comprise of a aluminum layer, (please see column 3, line 20 to column 4, line 1). The oxide is implicitly either stoichiometric or non-stoichiometric composition.

11. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Glass et al and Katsir et al as applied to claim 25 above, and further in view of the patent issued to Nelson (PN. 6,165,598).

The article having Fabry Perot filter coated on a substrate taught by Glass et al in combination with the teachings of Katsir et al as described for claim 25 above has met all the limitations of the claim.

Glass et al teaches that the reflecting layers of the Fabry Perot filter are made of aluminum and the spacer or intermediate layer is made of aluminum oxide, or a nitride, (please see column 4, line 1) but it does not teach explicitly that the nitride is of aluminum nitride. However Fabry Perot filter is based on interference properties of the multiple layers and both aluminum oxide and aluminum nitride are common or well-known dielectric materials for forming the layers for the interference filter as taught by **Nelson**, (please see column 5, lines 1-5). It would then have been obvious to one skilled in the art to apply the teachings of Nelson to modify the Fabry Perot filter of Glass et al to use aluminum nitride as alternative material for the spacer or intermediate layer for the benefit of allowing different design for the Fabry Perot filter. The nitride is implicitly either stoichiometric or non-stoichiometric composition.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (9:00-4:30), alternative Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Audrey Y. Chang, Ph.D.

/Audrey Y. Chang/
Primary Examiner, Art Unit 2872